IV. *Reports.*

Part i. of the twenty-fourth annual report for 1902–3 contains an account of the progress of the Survey by Mr. C. D. Walcott, director, who refers to the increase of work, and to the establishment of a separate hydrographic department under the charge of Mr. F. H. Newell. An obituary memoir, accompanied by a portrait, is given of Major J. W. Powell.

The detailed report on the "Mineral Resources of the United States," for 1902, by Mr. David T. Day, shows a continuation of the remarkable activity in the mineral industries, the total value exceeding one thousand million dollars—iron and coal being the most important products. There was a notable increase in the production of uranium and vanadium minerals, and these were nearly all shipped abroad in the crude state as mined. The production of bauxite was largely increased, while that of monazite, obtained chiefly from North Carolina and partly from South Carolina, showed a slight increase over the previous year. The production of crude petroleum and of natural gas also showed increase.

V. *Local Surveys.*

The Wisconsin Geological and Natural History Survey has sent copies of *Bulletins* Nos. 11 and 12. The former is a "Preliminary Report on the Soils and Agricultural Conditions of the North-central Portion of the State," by Dr. S. Weidman. It is illustrated by a soil map, on the scale of an inch to three miles, and this gives the general character of the soil over different "soil formations" or subsoils—in reality various alluvial and drift deposits. No. 12 is by Mr. C. D. Marsh on "The Plankton of Lake Winnebago and Green Lake," lakes of different types, one shallow, the other deep. As bearing on the question of fish-production, it is noted that Entomostraca, which furnish the basis of food for fishes, are more numerous in the deep than in the shallow lake.

We have received also vol. xiii. of the *Memoirs* of the Iowa Geological Survey, being the annual report for 1902 with accompanying papers. The papers comprise descriptions (seven in number) of various counties, by the State Geologist, Mr. Samuel Calvin, and his assistants. There is also a discussion of the requisite qualities of lithographic limestone, with a report on tests of the lithographic stone of Mitchell County, Iowa, by Mr. A. B. Hoen. The report is accompanied by a colour-printed plate drawn on the local stone and illustrating the quarry from which it was obtained. The sample, submitted for trial, was not wholly satisfactory, inasmuch as it was noticed in trueing the stone for printing that the surface-plane intercepted planes of bedding at small angle, but there is reason to hope that, as the stone is worked, larger and more perfect slabs may be obtained. H. B. W.

DISINFECTING STATIONS.

AN interesting article upon disinfecting stations, written by Prof. Henry R. Kenwood and Mr. P. J. Wilkinson, appears in the most recent issue of the *Journal* of the Sanitary Institute (vol. xxv., part i., April; London: Offices of the Sanitary Institute, Parkes' Museum, Margaret Street, W.).

It is now well recognised that the disinfection of textile articles can be effected by the use of steam more quickly, more certainly, and with less damage to the article disinfected than by the use of any other agent; and a steam disinfecting station is now considered an essential provision by sanitary authorities. As the steam penetrates into the interstices of the colder articles it undergoes condensation, and imparts its latent heat instantaneously to the colder objects in contact with it. Steam thus condensed into water occupies only a very small fraction (about 1/1600) of its former volume, and to fill the partial vacuum thus formed more steam presses forward, in its turn becoming condensed and yielding up its latent heat, and so on until the whole mass has been penetrated.

Saturated steam may be used as current steam at about atmospheric pressure; but there is an advantage, in point of time, in the employment of steam disinfecting apparatus in which saturated steam is used under pressure, and higher temperatures are thereby obtained, when very highly resistant organisms have to be destroyed.

The time required for disinfection by steam obviously depends upon the resistance of the organism to be destroyed, the bulk of the infected articles, and the pressure of the steam employed. The best researches indicate a pressure of 10 lb. (and therefore a temperature of 115° C.) for twenty minutes as trustworthy in general practice.

The steam may be generated in a special boiler, from whence it is conducted to the disinfecting chamber, and such a boiler is sometimes made to supply steam for laundry purposes; or the lower part of a jacketed oven may be filled with water, and by firing directly under the machine the steam may be raised in the jacket of the disinfector itself. This arrangement favours compactness and economy, but a separate boiler is more accessible for cleansing and repairs.

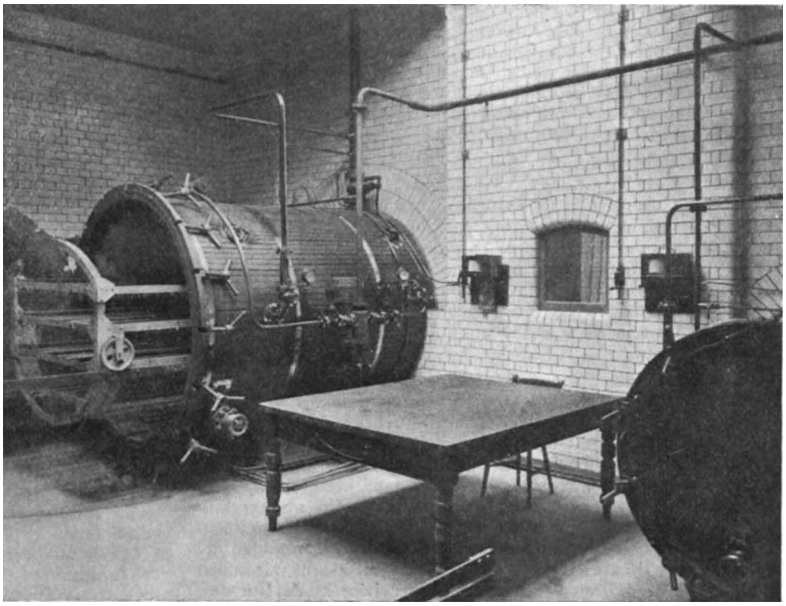

FIG. 1.—Interior of non-infected Chamber at the Fulham Disinfecting Station.

The various stoves now employed for disinfecting by steam may be classified as follows:—

(1) Stoves in which steam without pressure is employed. These are, of course, the simplest and cheapest.

(2) Those in which steam at low pressure (2, 3 or 5 lb. per sq. in.) is used. Although the temperature of 110° C. which can be reached by some of these stoves is generally sufficient, a higher temperature can never be employed in them. These stoves, though cheaper, meet with less general acceptance in this country than

(3) Those in which steam at high pressure (10 lb. and over) can be employed.

A temperature of 115° C. to 120° C. can be obtained in these stoves, and an exposure of articles for about twenty minutes will suffice for disinfection.

A disinfection station should comprise:—

(1) Two rooms completely separated from each other by

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a wall, into which the oven is built, so that it communicates with both rooms. In one chamber the infected articles are placed in the oven, and when disinfection is complete the articles are taken out in the other chamber.

(2) An incinerator or destructor for the combustion of useless infected articles.

(3) Separate sheds for (*a*) vans employed to bring infected articles, and (*b*) vans employed to return disinfected articles.

(4) A laundry and bath-room.

The article describes the forms of stoves mostly used in this country at the present day, the planning and construction of the disinfecting station, the staff, the disinfection of articles (leather goods, furs, feathers and books) which are injured by steam, the destruction of useless articles in a destructor furnace; and much useful information as to cost is also given.

The article is well illustrated. The illustration here reproduced shows the non-infected chamber; the door of one of the ovens is open, and the wheeled carriage running on internal rails is seen with the racks on which the clothing and bedding are placed. The observation window in the partition wall is permanently closed.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE physiological laboratory of the University of London will remain open for post-graduate research students during the vacation months August and September. Foreign graduates who may be desirous of working in the laboratory should previously communicate with the director or with the academic registrar of the university.

A COURSE in practical and clinical bacteriology will be held at King's College, University of London, from Wednesday, August 3, to Saturday, August 13. The course will consist of lectures, demonstrations, and practical work; in the latter, the members of the class will make for themselves permanent preparations of the chief pathogenic micro-organisms, and will carry out the principal manipulations employed in bacteriological investigations. Names should be sent in as soon as possible to the secretary or to Prof. Hewlett.

WE directed attention a short time ago (June 9, p. 138) to the new illustrated quarterly review *Buddhism*; in the third number is an interesting article on education in Burma, in which it is stated that the vernacular lay schools introduced by the British Government are by no means an unqualified success, since they have been organised without due regard for native conditions. "What object," says the anonymous writer, "has education to a jungle Burman except to form his character? And can Burmese character be moulded by studying the history or geography of Europe or standard readers garbled under European supervision? A Burman should be taught Burman ethics, morals and usage. The disobedience to the authority of parents, which is so alarming a feature in the present state of things, requires to be specially dealt with. The evil goes beyond mere disobedience and truancy—cases where boys rob their parents or wantonly commit other breaches of the law are increasing." Evidently Burma also is suffering from that peculiar British attitude of mind that seeks to constrain all peoples to conform to the ideals and methods of the Britons themselves.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 9.—"On the Action of the Venom of *Bungarus coeruleus* (the Common Krait)." By Major R. H. **Elliot,** I.M.S., W. C. **Sillar,** M.B., B.Sc., and George S. **Carmichael,** M.B., Ch.B.

Experiments were performed by the authors in the pharmacological laboratory of the University of Edinburgh with the following results:—

(1) The minimum-lethal dose of the dried venom was determined for frogs and small mammals, rats and rabbits. It was found that the M.L.D. for the frog was about 0·0005 of a gram per kilo., for the rat 0·001 gram per kilo., and for the rabbit the remarkably low dose of 0·00008 gram per kilo.

(2) It was found that Calmette's anti-venomous serum in quantities sufficient to protect rats against ten minimum lethal doses of cobra venom, in the same quantities was quite powerless to protect these animals from similar doses of krait venom.

(3) The condition of various nerve terminals was studied, both in animals that die after poisoning by krait venom and in nerve muscle preparations from the frog, and it was found that the integrity of these nerve ends was invariably involved at a comparatively early stage in the poison.

(4) The blood was carefully examined, and no evidence of antemortem clotting or intravascular hæmolysis was discovered.

(5) The action of krait venom was examined when its solution was perfused through the isolated vessels and heart, respectively, of the frog. It was found that this venom, while resembling in action that of cobra venom, differs greatly in the degree of constriction of vessels and enhancement of ventricular contraction produced. Cobra venom exercises an action in these directions many times greater than that of krait venom. Cardio-plethysmographic tracings are shown.

(6) Studying the manner in which the vital functions of mammals (rabbits, cats, and dogs) are influenced when exposed to the action of this venom, the authors show by means of kymographic and plethysmographic tracings that the vaso-motor centre is strongly affected, a suspension of the activity of this centre, as shown by the great splanchnic dilatation, rapidly ensuing after its transient stimulation. There are also indications of a feeble cardio-inhibitory action. The experiments and illustrative tracings likewise show that death is brought about by destroying the activity of the respiratory centre.

(7) From these results the conclusion may be arrived at that while the symptoms produced by krait poisoning are similar to those of cobra poisoning, they differ so much in relative degree as to render it doubtful if they can properly be spoken of as identical.

"Contributions to the Study of the Action of Sea-snake Venoms. Part i." By Sir Thomas R. **Fraser,** M.D., F.R.S., and Major R. H. **Elliot,** I.M.S.

The venoms used in the research were those of *Enhydrina Valakadien* and *Enhydris Curtus*.

The minimum-lethal doses of *Enhydrina Valakadien* venom were found to be:—for rats = 0·00009 gram per kilo. of body weight, for rabbits = 0·00006 gram per kilo. of body weight, for cats = 0·0002 gram per kilo. of body weight.

The minuteness of these doses indicates that sea-snake venom is the most lethal of all substances the lethal power of which has been determined.

Symptoms of Sea-snake Poisoning in Animals.—In the main these symptoms resemble those of cobraism, but the dyspnœa is more urgent.

Summary of Results.

(1) Enhydrina venom has no direct action on the walls of the arterioles, or at least has no action in any strength of solution which could be present in the blood of a human victim of sea-snake bite.

(2) Enhydrina venom acts directly on the isolated frog ventricle, producing a tonic and stimulating effect, but this action is produced only by very strong solutions (1 : 5000). The heart-beat is quickened, and the result is therefore similar to that produced by very weak solutions of cobra venom (1 : 1,000,000 or weaker).

(3) By experimenting with the mammalian heart exposed *in situ*, the authors have shown that Enhydrina venom has no direct action on the vagal cardio-inhibitory centre. This affords a striking contrast to the condition observed in cobra poisoning. In the latter case, the powerful tonic and stimulant action of the venom on the heart-muscle (or more probably on its nerve-ends) is masked by equally powerful and direct stimulation of the cardio-inhibitory centre. In Enhydrina poisoning, on the other hand, the complete absence of cardio-inhibition leaves the feeble tonic action on the heart free to manifest itself, as appears to be displayed in several of the tracings. The authors cannot

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